Bay Area and Delta

Alameda Creek and tributaries, Alameda and Santa Clara Counties

Potential Impediments to Anadromous Fish Migration

The BART Weir and an inflatable dam block fish passage at River Mile 9.7. This is a small portion of the range historically available to anadromous fish (Gunther and others 2000). There are eight dams, three weirs, a road crossing, and a gas pipeline crossing identified in Alameda Creek.

General Description

The Alameda Creek watershed is the largest drainage in the South Bay of the San Francisco Bay Area. It flows from the Diablo Range west through Sunol Valley and Niles Canyon into southeastern San Francisco Bay just north of the Highway 92 bridge. It drains about 700 square miles (Aceituno and others date unknown). Alameda County Water District, San Francisco Public Utilities Commission, and Zone 7 of the Alameda County Flood Control and Water Conservation District use Alameda Creek and its tributaries for water supply and transport. The lower 11 miles of the creek have been channelized for flood control (Gunther and others 2000). In addition to Alameda Creek, two large and several small tributaries are described below.

Fish Populations

Alameda Creek is historically home to runs of Coho and Chinook salmon, as well as Central California Coastal steelhead (Alameda Creek Alliance 23 Aug 2000). Today, only steelhead and Chinook salmon ascend the creek. They have recently been observed as far as 8 miles upstream from San Francisco Bay. In July 1995, the California Department of Fish and Game (DFG) did a stream inventory from Calaveras Dam to the Sunol Water Treatment Plant (SWTP). The report identified rainbow trout (DFG 1996). Fifteen rainbows were caught just upstream of Calaveras Creek during a 1987 DFG fish survey (DFG 1988). Follett (Aceituno and others date unknown) also documented rainbow trout in Alameda Creek in 1927, 1955, and 1957.

In 1999, three steelhead were captured at the BART Weir. The Alameda Creek Alliance has videotape and film of them. In recent years, a few Chinook salmon were seen in the flood control channel below the BART Weir. Salmon were also found in archaeological sites in the lower floodplain of Alameda Creek, but it is unknown if those fish were native or if they were transported to the sites (Gunther and others 2000). Run sizes for the salmon and steelhead runs in Alameda Creek are unknown. DFG manages a put-and-take fishery in Alameda Creek by stocking rainbow trout in the Niles Canyon area (Gunther and others 2000).

Water Quality

Alameda Creek is perennial in its upper reaches but is periodically dry in Sunol Valley. Many of the creek's tributaries may be cut off from the mainstem in the summer due to lack of flow. There are three major reservoirs in the Alameda Creek watershed, and water supply practices have greatly altered the natural flow in both the mainstem and its tributaries. The creek is used as a conduit for water by three Bay Area water supply agencies and water from Hetch Hetchy and the South Bay Aqueduct also augment its flows.

Very little water quality information is available. However, water quality does not appear to be a factor to the anadromous fish populations in Alameda Creek. The Niles Canyon area of the creek does have a relatively high summer temperature, "frequently exceeding 22° C and occasionally reaching 26-28° C in the upper part of the reach" (Gunther and others 2000). Water from the Central Valley flows through this watershed due to releases from the South

Bay Aqueduct. This may confuse returning fish and cause straying, but the extent of this straying has not been determined (Gunther and others 2000).

Hydrology

The lower 12 miles of Alameda Creek may become dry during the summer so flow may be a fish passage issue. The average yearly rainfall for Alameda Creek is about 15 inches (Alameda Creek Alliance 2000). Diversions at the Alameda County Diversion Dam may divert as much as 85 percent of the flow out of the creek (Gunther and others 2000). In 1957, a CDF survey found flow to range from 6 cfs to none in May. A 1996 DFG stream inventory reported flows of 3 cfs at the SWTP and 1.5 cfs just upstream of Calaveras Creek. In the same report, temperatures of 64-75° F were recorded for the same reach.

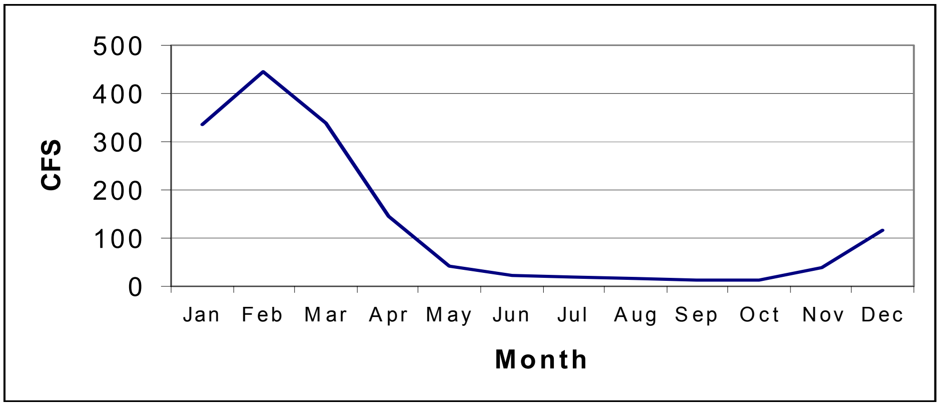

Figure 38. Mean streamflow for USGS stream gage 11179000 on Alameda Creek at Niles from 1891-2000 (USGS 2002).

There are eight USGS gaging stations on Alameda Creek and its tributaries; flow data from 1891 is available from the oldest gaging station. The other stations have data starting from 1912, 1957, 1964, 1994, and 1995 (USGS 2000a-h).

Habitat Quality

The 12-mile section of the creek that runs from San Francisco Bay to the mouth of Niles Canyon is a straight flood control channel. It has a paved bike path on the south side and a gravel equestrian road on the north side. The banks are lined with riprap and there is little vegetation (Horil 2001). Some spawning has been observed downstream of the BART Weir in this section, but the hatching success is estimated to be low due to gravel siltation, frequent flow fluctuation, and loss of channel features, such as pools, riffles, and riparian bank vegetation, as a result of the extensive channelization of the creek bed for flood control. Rearing could not occur in most of this reach. However, this reach may be important habitat for transition between freshwater and ocean habitat because it is tidally influenced (Gunther and others 2000).

The Niles Canyon reach of the river may have supported rainbow trout in the past. Today, the lower section may provide suitable habitat, but high temperatures decrease its value. Increased flow, due to releases from quarry operations in Niles Canyon, may help offset the effects of the increased temperature. Flow here is also augmented by releases for municipal water supply operations. Trout were observed in tributaries of this reach in 1999 (Gunther and others 2000).

The Sunol Valley reach of Alameda Creek has a wide, braided channel, which results in shallow flow and presents passage issues at low flows. There is good spawning substrate in this reach. However, rearing would be prevented by low summer flows and high temperatures caused by a lack of riparian cover. This reach could support trout if the summer temperatures could be lowered (Gunther and others 2000).

The Lower Ohlone reach of Alameda Creek supports a self-sustaining population of rainbow trout, which would indicate good habitat. The stream dries in spots during the summer, but pools provide adequate habitat (Gunther and others 2000). The Upper Ohlone reach has relatively pristine hydrology and supports a population of rainbow trout. This reach dries in the summer above the confluence with Valpe Creek (Gunther and others 2000).

Habitat Data

Habitat data for most of the Alameda Creek watershed is available in an assessment of the creek done for the Alameda Creek Fisheries Workgroup (Gunther and others 2000). Older habitat data is available for small portions of the creek. A 1988 DFG fish sampling report includes habitat data for the area immediately upstream of the Calaveras River and for a reach near the Wooden Bridge Creek crossing (DFG 1988). Temperature, pH, and dissolved oxygen measurements were collected in 1973 at six points in Alameda Creek (Aceituno and others date unknown). A May 1957 DFG stream survey contains channel, temperature, and flow data. A 1996 DFG stream inventory of the creek contains temperature, flow, and channel information as well as gravel location and embeddedness. Anecdotal habitat information is available (Spliethoff 2000, Alameda Creek Alliance 2000)

Fisheries and Restoration Projects

The Alameda Creek Steelhead Restoration Proposal, sponsored by the Alameda Creek Fisheries Restoration Workgroup, recommends removing barriers to anadromous fish migration in the Alameda Creek watershed. The workgroup published a report of habitat conditions and barrier information. The East Bay Regional Parks District has agreed to remove two concrete swim dams at an estimated cost of $100,000. The San Francisco Public Utilities Commission has announced it will study the removal or modification of two dams in the Niles Canyon reach of Alameda Creek. And the Alameda County Flood Control District and Alameda County Water District have teamed up to apply for funds from U.S. Army Corps of Engineers Section 1135 program, Projects for Improvement of the Environment. The money will be used to modify the lower flood control channel dams for fish passage.

In recent years, there have been various rescue efforts to transport steelhead around barriers, to collect fertilized eggs, rear the young, and release them in the Sunol Park area (Gunther and others 2000).

Tributaries

Arroyo Valle

Potential Impediments to Anadromous Fish Migration

Lake Del Valle is the only reservoir on Arroyo Valle and Del Valle Dam is a complete barrier to anadromous fish passage. There is also a drop structure in the creek, but it is not considered to be a passage problem.

General Description

Arroyo Valle begins on the west slopes of Black Mountain near the Santa Clara / Stanislaus County line and runs 33 miles northwest to its confluence with Arroyo de la Laguna at River Mile 6. Arroyo de la Laguna is a tributary to Alameda Creek at River Mile 17.

Fish Populations

In 1962, “steelhead/rainbow” trout were found by Skinner (cited in Gunther and others 2000) in Arroyo Valle. Today there are self-sustaining populations of rainbow trout in tributaries to Lake Del Valle (Gunther and others 2000). In a 1957 stream survey done by DFG before Del Valle Dam was built, rainbow trout were sighted in the upper reaches of the creek. DFG personnel conducting the survey assessed these trout to be resident, not anadromous, trout (DFG 1957). Before the dam was built there is no evidence of rainbow trout being stocked in Arroyo Valle, but steelhead rescued from Uvas Creek were planted in Arroyo Valle (DFG 1957).

The East Bay Regional Parks District and DFG operate a put-and-take rainbow trout fishery in Lake Del Valle, which is owned and operated by DWR. In 1973, DFG planted 45,672 rainbow trout followed by an additional 59,944 trout in 1994 (DFG 1974 and 1975). In 1990, EBRPD planted 54,144 pounds of rainbow trout and DFG planted 28,700 pounds. (DFG 1991). These fish are "planted from September to April or May" (DFG 1991). Sampling of fish in Lake Del Valle by DFG in 1972, 1973, 1976, and 1977 recovered stocked rainbow trout. Rainbow trout are also stocked at Shadow Cliffs Regional Recreation Area (Gunther and others 2000).

Water Quality

Water temperatures in the creek below Lake Del Valle are high. Flow in the lower 11 miles of the creek is heavily influenced by releases from the reservoir. Because it is managed for groundwater recharge, flows in the lower reach are probably erratic (Gunther and others 2000). In 1972, Zone 7 of the Alameda County Flood Control and Water Conservation District agreed to release 10 cfs of water from Del Valle Dam between 24 Apr and 30 Jun. This was arranged so that DFG could stock this area with fish (Zone 7 1972).

Temperature and dissolved oxygen (dissolved oxygen) are also problems in Arroyo Valle. In 1973, DFG measured dissolved oxygen and water temperature in Lake Del Valle near the dam. dissolved oxygen ranged from 5.2 to 10.7 and temperature ranged from 65° F at the surface to 51° F at a depth of 44 feet. DFG fish population surveys between 1972 and 1977 contain minimal temperature data. During a May 1986 survey of the creek below Lake Del Valle, a temperature of 72° F was recorded (Gray 1986).

Hydrology

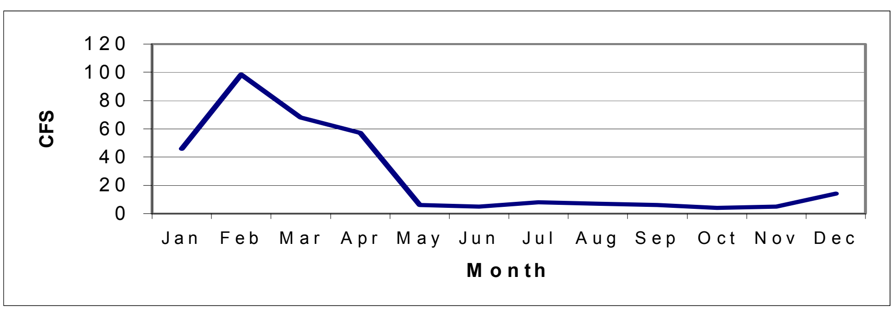

Figure 39. Mean streamflow for stream gage station 1117660 on Arroyo Valle in Pleasanton from 1957-1985 (USGS 2002).

Arroyo Valle is generally dry during the summer. A DFG survey done in mid-May 1957 reported no flow downstream of Pleasanton. Flow data from 1957 to 1999 is available from a USGS gage on Arroyo Valle near Livermore (USGS 2000).

Habitat Quality

Only the lowermost portion of Arroyo Valle has suitable spawning gravel. The portion of the creek below Lake Del Valle is channelized. Water temperatures in the lower reach of the creek are high because there is no shade. There are also high levels of sediment. The portion of this creek accessible to anadromous fish does not offer good spawning or rearing habitat (Gunther and others 2000). A 1957 DFG stream survey of Arroyo Valle described the lower portion of the creek as of little value for fish life while the extreme headwaters were said to "provide fine habitat for trout." In a 1986 DFG survey of the area 2,000 feet below Del Valle Dam the habitat was found to be "very good." It was described as having "a large amount of undercut banks, roots and boulders as well as good clean gravel." Sycamores, alders, and cottonwoods provided an estimated 30 percent canopy cover in this reach (Gray 1986).

Habitat Data

Most of the available habitat data is from habitat surveys done in 1999 in conjunction with An Assessment of the Potential for Restoring a Viable Steelhead Trout Population in the Alameda Creek Watershed, a report published by the Alameda Creek Fisheries Restoration Workgroup. The report also cites a 1962 survey (Gunther and others 2000). According to the assessment, Arroyo Valle is a channelized urban stream from its mouth to Shadow Cliffs Regional Recreation Area, and it is predominantly bordered by riprap. In 1986, DFG conducted a survey of the creek 2,000 feet below Del Valle Dam. Some habitat data was collected during the survey (Gray 1986).

Fisheries and Restoration Projects

During the 1986-1987 drawdown, in which the lake level was lowered, EBRPD, DFG, DWR, and area sport fishing clubs conducted fish habitat work at Lake Del Valle. They planted 250 arroyo willow trees in the southern portion of the reservoir where the banks were devoid of cover. They also anchored brush in the reservoir to provide cover for fish. About 600-800 hardwood limbs were anchored as well. Local Boy Scout troops also helped by collecting 200-300 Christmas trees and anchoring them in the reservoir so they would be in slow, shallow water during high water. They were placed in such a way that they would be easy to replace once decomposed (EBRPD 1987).

Arroyo Mocho

Potential Impediments to Anadromous Fish Migration

There are two drop structures and one road crossing on Arroyo Mocho.

General Description

Arroyo Mocho is part of the Alameda Creek watershed. It is 10 miles long and drains into Arroyo de la Laguna at River Mile 7. Arroyo de la Laguna is a tributary to Alameda Creek at River Mile 6. Arroyo Mocho runs through the Livermore and Amador Valleys.

Fish Populations

"Steelhead/rainbow" trout were documented in Arroyo Mocho in 1962 and today there are self-sustaining populations in the creek (Gunther and others 2000). A 1976 DFG survey found rainbow trout at three places on the creek: Lawrence Livermore pumping station, Cedar Brook Ranch, and Mines Road. A total of 44 rainbow trout were caught at the three sites on 3 Feb. (DFG 1976). In 1978, DFG approved a request to stock trout in a one-mile reach of the creek that runs through Robertson Park in Livermore. Zone 7 of the Alameda County Flood Control and Water Conservation District has allocated water from the South Bay Aqueduct for Arroyo Mocho in adequate amounts to sustain the stocked trout (DFG 1978). There are no estimates of the size of the fish run in Arroyo Mocho.

Water Quality/Hydrology

Flow and temperature are the biggest water quality issues in Arroyo Mocho. Quarries and groundwater recharge have altered the natural flow in the creek. During the summer, this tributary to Alameda Creek is one of the driest and most arid. Arroyo Mocho becomes two distinct sections separated by about 200 yards of creek bed in a gravel quarry area in Pleasanton. That section remains dry for most of the summer. Below this dry reach, water is supplied to Arroyo Mocho by releases from Lawrence Livermore National Laboratories and discharges from quarries (Gunther and others 2000). In the flood control channel reach above the dry area, water supplied by DWR via the South Bay Aqueduct is released into the creek for groundwater recharge. (Gunther and others 2000). Summer flows in the upper reaches of the creek are almost entirely due to water purchased from the State Water Project. Because this water is managed for groundwater recharge, it rarely continues downstream. Water infiltration rates are high in the Livermore Valley, so any excess SWP water is absorbed through the channel bottom and does not flow continuously downstream (Gunther and others 2000).

Zone 7 of the Alameda County Flood Control and Water Conservation District operates three gaging stations in the Arroyo Mocho watershed. Data from these gages, combined with an estimate for quarry pond releases, has been used to estimate flow and determine its adequacy for fish migration. The data suggest there is a range of 20 to 40 cfs in the Pleasanton reach of the flood control channel from January through March and flows are minimal in April and May. During a field survey in October 1999, flows in the upper and lower flood control channel were 10 to 12 cfs. This level of flow appeared to be sufficient for fish migration. Further analysis of the available data led Gunther to the conclusion that there is "a continuous wetted channel adequate for fish migration" through January and March and around storm events (Gunther and others 2000). The quality of water when it is present does not appear to be a limiting factor to anadromous fish populations in Arroyo Mocho (Gunther and others 2000).

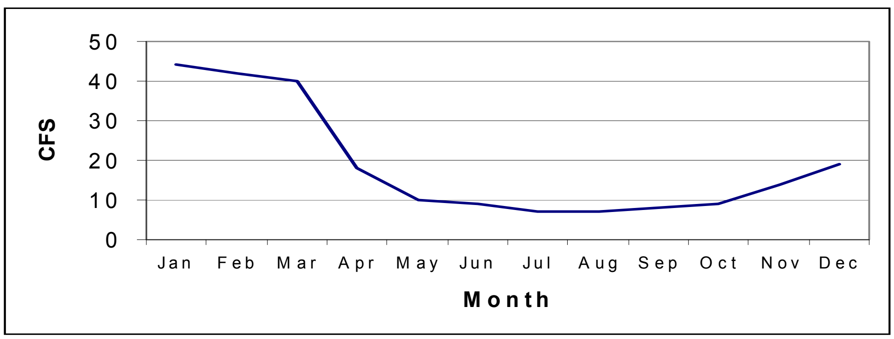

Figure 40. Mean streamflow at stream gage station 11176200 on Arroyo Mocho at Pleasanton from 1962-1985 (USGS 2002).

Habitat Quality

Below Wente Road, the creek channel is channelized and riprapped but it does have a natural bottom. The lower portion is not considered to be suitable spawning or rearing habitat due to lack of shade and high sedimentation. Between Murrieta's Well and the South Bay Aqueduct there is a section of natural channel with varying shade. The water temperature here was 70.5 °F according to a 2000 stream survey and there is predominately a gravel and cobble substrate (Gunther and others. 2000). From the aqueduct to the Mines Road Bridge, flow is low and there is generally less than 25 percent shade. However, temperatures were 20°C in this reach during a 2000 stream survey and trout have been documented here (Gunther and others. 2000). Boulders become more common upstream of this section. Near the Alameda-Santa Clara County line, the creek becomes largely dry with sections shaded mostly by small willows (Gunther and others 2000).

Habitat Data

Most of the habitat information available is from stream surveys done for a report, An Assessment of the Potential for Restoring a Viable Steelhead Trout Population in the Alameda Creek Watershed, published in February 2000 by the Alameda Creek Fisheries Restoration Workgroup. There is also 1964 to 1999 flow data available from the USGS gaging station on Arroyo Mocho near Livermore (USGS 2000).

Fisheries and Restoration Projects

No restoration or fishery projects are being carried out at this time.

Calaveras Creek

Potential Impediments to Anadromous Fish Migration

Calaveras Dam is the only barrier on Calaveras Creek and it is impassable.

General Description

Calaveras Creek is a tributary to Upper Alameda Creek at River Mile 26. It is 5.4 miles long and has one major reservoir, Calaveras Reservoir. The reservoir is fed by natural streams as well as by a pipeline, which delivers Alameda Creek water from a diversion at the Alameda Creek Diversion Dam on Alameda Creek (Gunther and others 2000).

Fish Populations

Calaveras Creek is a tributary to Alameda Creek above several impediments to fish migration. At least one of these barriers is considered to be impassable. This eliminates any anadromous fish from gaining access to Calaveras Creek. There are self-sustaining populations of rainbow trout above Calaveras Reservoir, in an upstream tributary Arroyo Hondo, and possibly in Smith and Isabel Creeks. These populations are probably derived from coastal steelhead, which were trapped in the upper watershed (Gunther and others 2000). According to the Alameda Creek Fisheries Restoration Workgroup report, there were fish surveys of various reaches of Calaveras Creek done in 1905, 1938, 1972, and 1977 (Gunther and others 2000). DFG sampling of Calaveras Reservoir in May, June, August, and October 1973 document a rainbow trout population in the reservoir.

Water Quality

Summer water temperature is relatively high in this creek below Calaveras Dam (Gunther and others 2000). A 1965 limnological study of Calaveras Reservoir contains data about temperature, turbidity, dissolved oxygen, and pH of the water at four sites in the reservoir. Temperatures ranged from 75.5° F to 47.7° F and stratification did occur. dissolved oxygen ranged from 1.6 to 9.0 ppm and pH was 7.5 to 8.5 (DFG 1965). In 1973, DFG recorded water temperature during three fish samplings in the reservoir. The results were 72° F in late May, 76° F in mid June, and 62° F in October.

Hydrology

During a 15 Apr 1988 fish sampling by DFG, flow in Calaveras Creek was measured at 0.068 cfs. The same point measured in September of the same year had a flow of 0.594 cfs. In April flow was not continuous from Calaveras Dam to the confluence with Alameda Creek. Flow was intermittent upstream of the Hetch Hetchy pipe abutment. While USGS does not have a flow gage on Calaveras Creek, there is one on Alameda Creek below its confluence with Calaveras Creek with data available from 1995 to 1999 (USGS 2000).

Habitat Quality

A 1995 stream survey by DFG found that the area between Calaveras Dam and the confluence with Alameda Creek has a very steep gradient with the substrate being mostly very large boulders. It is believed that passage through this section is difficult or impossible at most flows and is therefore considered “unsuitable for the re-establishment of a trout population” (DFG 1996).

Habitat Data

Other than limnological data, very little habitat data is available for Calaveras Creek. No vegetation data was found. A brief mention of channel gradient and substrate can be found in An Assessment of the Potential for Restoring a Viable Steelhead Trout Population in the Alameda Creek Watershed (Gunther and others 2000).

Fish Passage and Restoration Projects

No restoration or fishery projects are being carried out at this time.

Arroyo de la Laguna

Arroyo de la Laguna is a tributary to Alameda Creek parallel to Interstate 680. There are no identified barriers on this tributary and flow appears to be adequate for migration to other tributaries. Below its confluence with Arroyo Mocho, Arroyo de la Laguna has poor breeding and rearing habitat. The substrate is mostly sand, there is poor pool development, and summer temperatures may be high. Sections of Arroyo de la Laguna near Arroyo Mocho have been channelized for flood control. A 1963 survey found rainbow trout in Arroyo de la Laguna; however, DFG fish surveys in 1976 and 1986 did not recover rainbow trout (DFG 1986). Only warm water, nongame fish were caught in these surveys. Some temperature and flow data is available in these fish surveys for limited portions of the creek. The lowermost portion of the creek may be suitable for trout and there is little information about the upper reaches (Gunther and others 2000).

Pirate Creek

Pirate Creek is a tributary to Alameda Creek in the Sunol Valley. Rainbow trout were observed in the lower reaches of Pirate Creek during sampling by Alameda County in 1999 (Gunther and others 2000).

San Antonio Creek

San Antonio Creek is a tributary to Alameda Creek just upstream of the Interstate 680 crossing. Historically there were steelhead in San Antonio Creek but “by the early 1960s, Alameda Creek steelhead runs were essentially eradicated” (DFG 1978). James H.Turner Dam creates San Antonio Reservoir and blocks access to San Antonio, La Costa, and Indian Creek watersheds all of which had steelhead historically (Leidy 1984). There are self-sustaining populations of rainbow trout in tributaries to the reservoir and habitat above the reservoir is considered potential steelhead habitat (Gunther and others. 2000). A 1978 trout survey by DFG reported dense populations of young-of-year rainbow trout in San Antonio Creek above the reservoir, in lower and upper La Costa Creek, and in lower and middle Indian Creek.

Stoneybrook Creek

Stoneybrook Creek is a tributary to Alameda Creek at Palomares Road. DFG found rainbow trout in Stoneybrook Creek in 1976. Rainbow trout have also been documented recently in the creek during sampling by the East Bay Regional Park District. Temperatures in Stoneybrook Creek were consistently measured below 64.4 F (18° C) in summer 1999, which is within the suitable range for steelhead trout (Gunther and others 2000).

Valpe Creek

Valpe Creek is a tributary to upper Alameda Creek. Rainbow trout were seen in Valpe Creek in 1999 (Gunther and others. 2000).

Welsh Creek

Welsh Creek is a tributary to Alameda Creek in Sunol Valley. Alameda County found rainbow trout in the creek during sampling in 1999. There is a natural barrier 0.3 miles from the confluence with Alameda Creek which blocks access to the rest of the creek (Gunther and others 2000).

Sinbad Creek

Sinbad Creek is a tributary to Arroyo de la Laguna near its confluence with Alameda Creek. This creek historically had steelhead in it but does not have a persistent population of rainbow trout. Temperatures in Sinbad Creek were consistently measured at below 64.4°F in summer 1999 (Gunther and others 2000).

San Francisquito Creek, Santa Clara and San Mateo Counties

Potential Impediments to Anadromous Fish Migration

San Francisquito Creek has two dams, a drop structure, a weir and a golf cart crossing that can impede anadromous fish migration between Searsville Dam and its discharge into San Francisco Bay. Searsville Dam blocks the migration of steelhead trout to the tributaries upstream of Searsville Lake.

General Description

The San Francisquito Creek watershed extends 45 square miles from the Santa Cruz Mountains to San Francisco Bay. Several creeks draining Skyline Ridge join together above and below Searsville Lake in Portola Valley to form San Francisquito Creek. Tributaries flowing into San Francisquito Creek above Searsville Lake include Corte Madera Creek, Sausel Creek, Martin Creek, and Alambique Creek. Tributaries flowing into San Francisquito Creek below Searsville Lake include Bear Creek and Los Trancos Creek. The creek continues through the hills above Stanford University, then between Palo Alto and Menlo Park and finally flows into San Francisco Bay.

Fish Populations

Historically, in addition to steelhead trout, San Francisquito Creek supported a run of Chinook salmon (SFEP 1997). There are no records of Central California Coho salmon in the San Francisquito watershed; however, since they are widely distributed, it is possible that they may have inhabited the watershed (Launer and Spain 1998). Today, steelhead trout are the only salmonids inhabiting the San Francisquito watershed. Steelhead trout are found in various tributaries of the Bear Creek watershed (Smith and Harden Date Unknown) and Los Trancos Creek (Launer and Spain 1998). Fish surveys have been performed by the state Department of Fish and Game from 1974 to1996. These fish surveys are unavailable.

Water Quality

The water in San Francisquito Creek has a high silt load and high levels of the pesticide diazinon (USEPA 1998), a widely used organophosphate. As the creek passes through urban Palo Alto and Menlo Park, the creek receives storm water discharges, which can contain various levels of pesticides, oils, heavy metals and other contaminants. Coordinated Resource Management and Planning and the city of Palo Alto sampled and analyzed water for various pesticides and heavy metals in the San Francisquito watershed from 1997 to 1998 (San Francisquito Creek CRMP 13 Sep 2000).

Hydrology

The flows in San Francisquito Creek are highly seasonal. The U.S. Geological Survey (USGS) maintains a stream flow gage at Stanford University and records are available from 1930 to 1941 and since 1950. Historic flows range from peaks of over 1,500 cfs in the winter to less than 0.5 cfs during summer and early fall (USGS 2000). The creek reportedly runs dry in the summer (Cities of Menlo Park, Palo Alto, East Palo Alto, San Mateo County and the Santa Clara County Water District 2000). One USGS gaging station at Stanford University has data available from 1930 to 1941 and since 1950 (USGS Nov. 28, 2000)

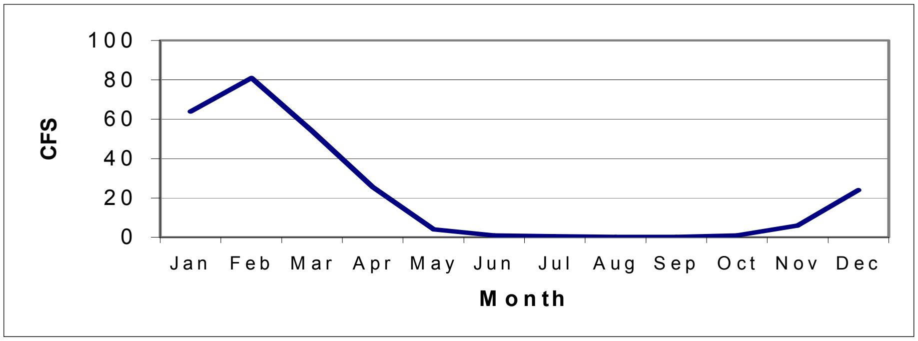

Figure 41. Mean stream flow for USGS stream gage station 11164500 on San Francisquito Creek at Stanford University from 1930-2000 (USGS 2002).

Habitat Quality

The spawning habitat quality of San Francisquito Creek is variable as it flows from the minimally developed lands of Stanford University through the downstream urban areas of Palo Alto and Menlo Park. The reach of San Francisquito Creek between Junipero Serra Boulevard to Highway 101 has been described as suboptimal spawning habitat as most of this area is dominated by fine materials such as sand and by gravel/cobble in the upstream area. This area appears to provide primarily migration habitat for steelhead, although several barriers to migration exist (Cities of Menlo Park, Palo Alto, East Palo Alto, San Mateo County and the Santa Clara County Water District 2000).

The existing shading, summer water temperatures, and spawning habitat have been described as good in the Bear Creek watershed, which is upstream of Searsville Dam. Upper portions of the watershed are protected in parks or California Water Service lands. Streambeds have been described as clean; however, streamflows were low to extremely low in the summer (Smith and Harden, No Date).

The upper San Francisquito watershed has been the focus of fish surveys conducted during the 1990s. Bear Creek and Los Trancos Creek contained the largest number of steelhead and seemed to provide the most significant spawning grounds for the species (Cities of Menlo Park, Palo Alto, East Palo Alto, San Mateo County and the Santa Clara County Water District 2000).

Habitat Data

Studies include Stanford University's surveys in 1997, 1998, and 1999 of biotic diversity within various parts of the watershed (San Francisquito Creek CRMP 2000), and the San Francisquito Creek Bank Stabilization and Revegetation Master Plan contains a discussion of existing habitat conditions between Junipero Serra Boulevard and Highway 101.

Fisheries and Restoration Projects

San Francisquito Creek lies within many jurisdictions and, as a result, there are many entities involved in addressing drainage and environmental issues in the watershed. An attempt to build a consensus among the various interests led to the formation of the San Francisquito Creek Coordinated Resource Management and Planning group. The CRMP was formed in late 1993 and includes more than 80 government agencies and community organizations (Peninsula Conservation Center Foundation 2000).

The CRMP hired a streamkeeper to provide maintenance and administrative support to San Francisquito Creek and prepared the September 2000 draft report Long-term Monitoring and Assessment Plan for the San Francisquito Creek Watershed. The purpose of this plan is to provide a means of identifying and prioritizing information needs and coordinating monitoring and assessment activities. In addition, the CRMP prepared the 1998 Reconnaissance Investigation Report of San Francisquito Creek, summarizing historical floodplain management proposals and discussing feasibility, impacts and preliminary cost estimates of potential projects.

A Joint Powers Authority was formed in May 1999 between the cities of East Palo Alto, Palo Alto, and Menlo Park as well as the Santa Clara Valley Water District and the San Mateo Flood Control District, CRMP and Stanford University. The JPA is examining flood issues within the San Francisquito watershed (San Francisquito Creek CRMP 2000).

The Santa Clara Basin Watershed Management Initiative was established in 1996 by Environmental Protection Agency, the State Water Resources Control Board, and the San Francisco Bay Regional Water Quality Control Board. Water quality issues are being examined in the basin, which includes the San Francisquito Creek watershed (San Francisquito Creek CRMP 2000).

The San Francisquito Creek Bank Stabilization and Revegetation Master Plan is being prepared for a portion of San Francisquito Creek between the Junipero Serra Bridge to University Avenue. It is being sponsored by the cities of Menlo Park, Palo Alto, East Palo Alto, San Mateo County and the Santa Clara County Water District. The report includes mapping of conditions, a conditions report and a master plan report (Cities of Menlo Park, Palo Also, East Palo Alto, San Mateo County, and the Santa Clara County Water District 2000).

The Searsville Lake Sediment Impact Study is being prepared for Stanford University and was to be completed in 2001. This project was to analyze downstream sediment impacts including existing conditions and conditions based on various scenarios of Searsville Dam (San Francisquito Creek CRMP 2000).

A Comparison of Water Quality in Urban and Rural Stormwater Runoff study was funded by San Mateo County and was completed in October 2000. This project compares pollutants in storm water runoff discharged in urban and rural areas of the watershed (San Francisquito Creek CRMP 2000).

The cities of East Palo Alto, Menlo Park, Woodside and Portola Valley and San Mateo County are conducting a study to develop diazinon and sediment reduction plans for San Mateo County jurisdictions as part of the Habitat Enhancement and Flood Hazard Reduction Plan (San Francisquito Creek CRMP 2000).

Tributary

Los Trancos Creek

Potential Impediments to Anadromous Fish Migration

There are a series of weirs that are easily passed on Los Trancos Creek near and under Highway 280. There are no significant barriers between the mouth and the Stanford University Diversion Dam, which has a fish ladder that allows migration to 3.5 miles of potential habitat. However, there are three difficult barriers within this reach of potential habitat, including a 6-foot high concrete flashboard dam 0.1 miles upstream of the Los Trancos Road and Alpine Road intersection. Additionally there is a double box culvert at the Los Trancos Road crossing upstream of Alpine Road, and a box culvert on the Emergency Fire Access Road 0.1 miles downstream of the second Los Trancos Road crossing (Smith and Harden 2001).

General Description

Los Trancos Creek is a tributary of San Francisquito Creek that traverses Santa Clara and San Mateo Counties, entering San Francisquito Creek about river mile 8.3. Los Trancos

Creek is about 8 miles long and its total watershed encompasses about 7.5 square miles, ranging in elevation from 500 feet at its headwaters to 200 feet at its confluence with San Francisquito Creek.

Fish Populations

Steelhead trout are found throughout the Bear Creek watershed, including Los Trancos Creek. One pass electroshocking samples in 1997-1999 found that Los Trancos has an abundance of steelhead 4-5 times higher than that of San Francisquito Creek (Launer and Spain 1998, Launer and Holtgrieve 2000).

Water Quality/Hydrology

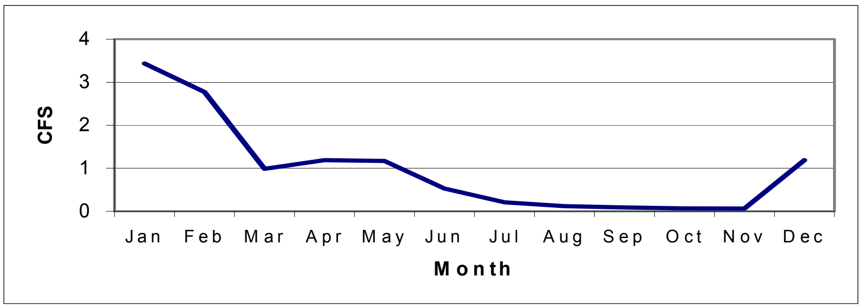

Figure 42. Mean stream flow recorded at USGS gage station 11163000 on Los Trancos Creek at Stanford University from 1930-1941 (USGS 2002).

Streamflow in Los Trancos Creek is highly seasonal and fluctuates sharply in response to winter storms.

The USGS maintained a stream gage station at Stanford University that measured daily streamflow from 1930 to 1941 (USGS 2002).

Habitat Quality

Spawning habitat is common in Los Trancos Creek, and probably provides some fry for stretches of San Francisquito Creek (Harvey and Associates 2001). Rearing habitat also exists in Los Trancos Creek but is constrained by very low late-summer streamflows, even in wet years (Harvey and Associates 2001). Los Trancos Creek downstream of the Stanford Diversion Dam has habitat that has a steep enough gradient to create riffles and runs likely to support moderate insect production and steelhead feeding even under late summer flows (Harvey and Associates 2001). All of the streams in the San Francisquito Creek watershed run turbid with storm flows, but Los Trancos Creek, with a relatively undeveloped watershed, appears to clear most rapidly after storms and has relatively clean substrate (Harvey and Associates 2001).

Habitat Data

Habitat Data for Los Trancos Creek is limited. More information is available concerning habitat data for San Francisquito Creek (see San Francisquito Creek in this report).

Hankinson and Smith from San Jose State University are doing studies to determine genetic relationships among different populations of South San Francisco Bay and Central California Coast steelhead/rainbow trout and the relative influence of hatchery stocking on population genetics. Their study reach includes Los Trancos Creek. According to Geoff Brosseau, Acterra, Palo Alto, California, results from this study should be available in the winter of 2002.

Some habitat data for Los Trancos Creek is available in Harvey and Associates (2001) Searsville Lake Sediment Impact Study: Biotic Resources Synthesis Report. This report is available online at http://facilities.stanford.edu/searsville/draft/biotic_resources.pdf

Long term water quality monitoring has been conducted to characterize wet season conditions at Piers Lane. Data from this study is available from Geoff Brosseau, Acterra, Palo Alto, California.

Fisheries and Restoration Projects

Stanford University is working with the Department of Fish and Game to improve the fish ladder at the Felt Lake Diversion Dam, owned by the University, so that it passes fish more readily. Modifications to the fish ladder are estimated to cost around one million dollars, including planning, permitting, and construction. The implementation schedule is contingent upon the University's ability to secure a funding source to share the cost of the project, but if grant funding is available, the project could begin as soon as spring of 2004.

In March 2002, the San Francisquito Creek Joint Powers Authority submitted a grant proposal to the American Rivers – NOAA Community-Based Restoration Program Partnership on behalf of the Watershed Council to fund a project to remove the Los Trancos/Agosti flashboard dam. The Watershed Council, tentatively, has been awarded $49,000 for the removal of the flashboard dam, with funding contingent upon the development of a conceptual removal plan and cost estimates. DWR's Fish Passage Improvement Program is providing the conceptual plans and cost estimates to help secure funding for the project.

Marsh Creek, Contra Costa County

Potential Impediments to Anadromous Fish Migration

The lower Marsh Creek drop-structure is a grade control structure about 4 miles upstream from the mouth of Marsh Creek at Big Break in the western Delta. This drop structure is the farthest downstream fish passage barrier in the watershed. Marsh Creek Dam is about 7 river miles upstream of the lower Marsh Creek drop-structure, and is also a major fish passage barrier. Sand Creek, a Marsh Creek tributary, contains a drop structure that is about 3 miles upstream of the Marsh Creek drop structure and impedes migration to perennial pools in upper Sand Creek. These pools are on protected land within the East Bay Regional Park District's Black Diamond Mines Regional Park.

General Description

Marsh Creek flows for about 30 miles from its headwaters on the eastern flank of Mt. Diablo to its mouth at Big Break in the western Delta and drains about 128 square miles. Tributaries of Marsh Creek include Briones, Dry, Deer, and Sand Creeks. Marsh Creek and its tributaries flow through a variety of range, farm, and urban lands.

Fish Populations

There is little historical information on salmonid runs in Marsh Creek. Marsh Creek does appear to support reproducing runs of Chinook salmon. Scientists from the Natural Heritage Institute observed adult Chinook salmon below the lower Marsh Creek drop structure in the fall of 2002. In addition, NHI scientists observed and photographed a steelhead trout just below the drop structure (Robins and Cain 2002). There is also an existing population of rainbow trout in the upper watershed (Robins and Cain 2002). NHI scientists also interviewed local anglers along Marsh Creek who have reported that salmon runs have numbered in the hundreds for at least five years (Robins and Cain 2002). These observations have been substantiated by a limited number of fisheries surveys. Slotton and others (1996) reported five juvenile Chinook salmon in lower Marsh Creek during water quality surveys. Additionally, according to Erika Cleugh, DFG biologist, 13 juvenile Chinook salmon (60-80mm) were observed below the lower Marsh Creek drop structure. It is unclear if Chinook salmon are successfully reproducing in Marsh Creek or if the juveniles migrated upstream from the Delta to rear in Marsh Creek.

Water Quality

Several factors have led to the degradation of water quality in the Marsh Creek watershed, including extensive agriculture development, urbanization, and mercury mining activities that began in the 1850s. Marsh Creek Reservoir has been closed to fishing since the mid-1980s due to high concentrations of mercury found in fish both in and upstream of the reservoir.

Hydrology

Streamflows in Marsh Creek fluctuate sharply in response to winter storms. Streamflow is highly seasonal, with the majority of flows occurring in the months of January and February.

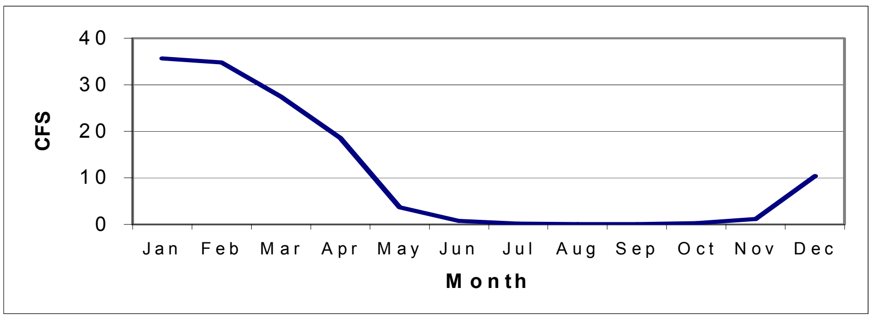

Figure 43. Mean stream flow recorded at USGS stream gage 11337500 on Marsh Creek in Byron from 1953-1983 (USGS 2002).

The USGS has a stream gage in Byron that recorded peak stream flows from 1954-1983, daily stream flows from 1953-1983, and water quality samples in 1970.

Habitat Quality

The lower portion of Marsh Creek has poor habitat due to a lack of vegetation and gravels. There is riprap on the stream bottom that may be used for spawning (NHI 2001). Widespread clearing of vegetation in the 1960s for flood control purposes has created higher water temperatures, lower dissolved oxygen levels, and increased sediment loading (Robins and Cain 2002).

Despite the poor habitat quality in the lower reaches of Marsh Creek, Robins and Cain (2002) reports that multiple areas of suitable spawning habitat for fall-run Chinook salmon exist in the 7 miles of stream between Marsh Creek Dam and the lower Marsh Creek drop structure. This portion of lower Marsh Creek contains numerous regions of gravel and a narrow band of riparian woodland that forms a canopy over the channel that moderates stream temperatures. In addition, potential spawning and over-summering habitat for both steelhead and Chinook is available in the intermediate and upper zones of the watershed. The presence of rainbow trout in the upper Marsh Creek watershed suggests that there are suitable habitat conditions available (Robins and Cain 2002).

Habitat Data

NHI and the Delta Science Center at Big Break prepared The Past and Present Condition of the Marsh Creek Watershed (Robins and Cain 2002). This document contains a discussion of existing habitat conditions.

NHI has also prepared the Corridor Width Report, Parcel Inventory, and Conceptual Stream Corridor Master Plan for Marsh, Sand, and Deer Creeks in Brentwood, California (Walkling 2002). This document contains habitat information as well.

University of California Berkeley graduate students overseen by NHI performed vegetation surveys and pebble count surveys in 2001. Survey information is available from NHI.

The USGS stream gage in Brentwood collected water quality samples in 2000 (USGS 2002).

Fisheries and Restoration Projects

According to Rich Walkling of NHI in Berkeley, the following projects are planned or proposed:

NHI, in partnership with the Delta Science Center and DWR's Fish Passage Improvement Program, received a $6,000 grant in 2002 from American Rivers and NOAA to develop a set of alternative designs for modifying or removing the lower Marsh Creek drop-structure. This project will enable upstream migration of Marsh Creek's existing run of fall-run Chinook salmon and possibly steelhead trout. These designs will be specifically created for incorporation into corridor restoration plans being developed by NHI and the city of Brentwood.

NHI and the Brentwood are semifinalists to receive funds from DWR and California State Parks to purchase the Griffith Parcel; 5 to 11 acres at the confluence of Marsh, Sand, and Deer Creeks. Plans include widening and reshaping the channel to restore meander, improve riparian vegetation, and restore the floodplain.

CALFED has awarded $120,000 to NHI for a watershed assessment, water quality monitoring program, and identification of potential restoration projects.

The California Coastal Conservancy awarded NHI $30,000 for design of a creek corridor protection plan in Brentwood.

2.9 million dollars in CALFED funding is pending for 30 acres of tidal marsh restoration at the mouth of Marsh Creek, water quality monitoring, public outreach and education and restoration of three sites along Marsh Creek in Brentwood.

CALFED has recommended the restoration of Dutch Slough as a directed action. This restoration project involves restoring about 1,000 acres of shallow water tidal marsh at the mouth of Marsh Creek to the east of the current channel.

Contra Costa County Flood Control District has plans for several detention/retention basins in the watershed, including two on Sand Creek, and an expansion of the existing Marsh Creek reservoir a few miles upstream from Brentwood.

The Contra Costa County Flood Control and Water Conservation District plans to remove or redesign the drop structure on Sand Creek to facilitate fish passage if the lower Marsh Creek drop-structure is removed or modified to pass anadromous fish.

San Lorenzo Creek, Alameda County

Potential Impediments to Fish Passage

A variety of flood control and road projects have created potential impediments to fish passage, and have led to fragmentation and isolation of aquatic habitats. Palomares and Cull Creek are not accessible to anadromous steelhead due to the presence of Don Castro Dam, completed in 1965, and Cull Canyon Dam, completed in 1962. Both of these dams are impediments to fish migration, and both reservoirs provide habitat for introduced warm water species, such as bass, that prey on juvenile salmonids.

Only Castro Valley Creek, Crow Creek, and San Lorenzo Creek downstream of Don Castro Dam are accessible to steelhead. However, steelhead using these areas must pass through 3.9-mile concrete channel from near the San Francisco Bay to Foothill Boulevard constructed by the USACE between 1953 and 1962. This channel impedes steelhead passage under most flow conditions (Kobernus 1998). Additionally, in 1972 a 2,000-foot section of Crow Creek just upstream of its confluence with Cull Creek was channelized and covered. This section of altered stream likely impedes migration under most flows (Love 2001). The half-mile concrete culvert under Interstate 580 may also impede fish migration (ACFC & WCD 2002).

General Description

San Lorenzo Creek is about 12.5 miles long with a total watershed area of 48 square miles. The headwaters of San Lorenzo Creek are in the mountains above eastern San Francisco Bay, and it flows through the cities of Hayward and San Leandro, where it then drains into the San Francisco Bay. San Lorenzo Creek has several tributaries including Castro Valley Creek, Chabot Creek, Cull Creek, Crow Creek, Norris Creek, Bolinas Creek, Sulphur Creek, Eden Canyon Creek, Hollis Creek, and Palomares Creek.

Fish Populations

According to the Alameda County Flood Control and Water Conservation District (ACFC & WCD 2002), stream habitat throughout the San Lorenzo Creek watershed supports native fish populations. However, salmonid populations are low. Rainbow trout are present in low numbers, probably as a result of stocking in Don Castro Reservoir (ACFC & WCD 2002). San Lorenzo Creek had highly productive steelhead runs up until the 1950s (ACFC & WCD 2002). Steelhead-spawning habitat had become severely limited as early as 1953 (DFG 1953 as cited in ACFC & WCD 2002).

The DFG performed fisheries surveys in 1960 and 1975. In 1960 DFG biologists surveyed major tributaries of San Lorenzo Creek, including Cull, Palomares, Crow and Eden Canyon Creeks. Rainbow trout or steelhead fry were found in Palomares Creek only. In 1975 DFG biologists surveyed San Lorenzo and Crow Creeks and found resident adult rainbow trout in Bolinas Creek, which is a tributary to Crow Creek, but no juveniles were found. DFG biologists concluded that the steelhead run was extirpated due to channel degradation (DFG 1975). Leidy (1984) performed a survey in 1981 in Palomares Creek and no adult or juvenile salmonids were found. In 1998 two rainbow trout were found during surveys by the San Lorenzo Creek Watershed Project, which is administered by the Alameda County Wide Clean Water Program in partnership with the Natural Resources Conservation Service and the Alameda County Resource Conservation District (Greiner Woodward Clyde 1999).

The ACFC & WCD (2002) reports that there have been numerous reports of adult steelhead and rainbow trout being caught by local anglers or observed in San Lorenzo Creek during wet years from the 1970s to the present. On two occasions, January 2000 and March 2000, ACFC & WCD reported trout in Castro Valley Creek near Knox Street in Hayward. In electroshocking surveys conducted by ACFC & WCD in 2001, three young-of-year rainbow trout were sampled in Crow Creek. Additionally, these surveys gathered adult rainbow trout from Crow Creek and San Lorenzo Creek. Two adult steelhead/rainbow trout were observed in May 2002 in San Lorenzo Creek in the natural section of creek between Foothill Boulevard and 2nd Street in Hayward, according to Emmanuel da Costa, ACFC &WCD, Alameda, California.

Water Quality

Fine sediment loads and episodic poor water quality has limited the numbers and distribution of salmonids in the San Lorenzo watershed. Urbanization has led to increased sediment loading, degraded water quality, altered stream hydrographs, and degraded riparian conditions (ACFC & WCD 2002). Kobernus (1998) found non-point source pollutants such as paint, automobile batteries, concrete, soap, and motor oil in San Lorenzo Creek. Fish kills have been reported from chlorine (DFG 1975) and well-drilling sediments (Kobernus 1998). In addition, potentially harmful levels of diazinon have been recorded in the watershed (ACFC & WCD 1997 as cited in ACFC & WCD 2002).

Water temperatures in the upper reaches above Don Castro Reservoir are generally less than 18° C. Water temperatures remain relatively warm downstream of Don Castro Dam and the Crow Creek confluence, usually exceeding 21° C for as much as 25 percent of the time and often exceeding 24°C. Despite this reach of low-quality habitat, the majority of the watershed has cold water temperatures that can support trout (ACFC & WCD 2002).

Hydrology

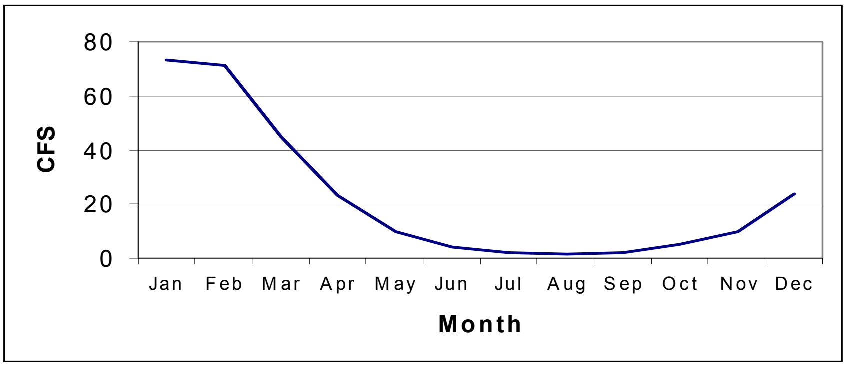

Figure 44. Mean streamflow recorded at USGS stream gage station 11181040 on the San Lorenzo River in San Lorenzo from 1967-2000 (USGS 2002).

Streamflow is highly seasonal and fluctuates sharply in response to winter storms. The USGS maintains several stream gages throughout San Lorenzo Creek watershed. A gage at Don Castro Reservoir recorded peak stream flow from 1981 to 2000, and has recorded daily stream flow and taken water quality samples from 1980 to 2000. A gage in Hayward recorded peak stream flow and daily stream flow from 1940 to 2000 and water quality samples were recorded in 1971. A gage in San Lorenzo recorded peak stream flow from 1968 to 2000, daily stream flow from 1967 to 2000, and water quality samples from 1989-1993. The USGS also operates a stream gage on Crow Creek, immediately upstream of Crow Canyon Road. This gage recorded peak stream flow from 1998-2000, daily stream flow from 1997-2000, and water quality samples from 1999-2000. Cull Creek, which joins Crow Creek immediately downstream of Crow Canyon Road, has a USGS stream gage immediately upstream of Cull Reservoir. This gage has recorded peak stream flow from 1979-2000, daily stream flow from 1978-2000, and water quality samples from 1979-2000. Another USGS station is below the Cull Reservoir Dam. This gage station recorded peak stream flow in 1979, daily stream flow from 1978-1979, and water quality samples in 1979 (USGS 2002).

Habitat Quality

Most of the aquatic habitat in the watershed has been greatly altered as a result of urbanization. Fish habitat in San Lorenzo Creek varies significantly from the upper reaches downstream to the San Francisco Bay. Cold water habitat in the upper parts of the watershed would likely support steelhead/rainbow trout in Palomares Creek, Hollis Creek, Eden Canyon Creek, Norris Creek, upper Crow Creek, upper San Lorenzo Creek, Bolinas Creek, Cull Creek, Castro Valley Creek, Chabot Creek, and Sulphur Creek (ACFC & WCD 2002).

However, most of this habitat is isolated above dams and flood control projects. Relatively cool water exists above Don Castro Dam, but high temperatures due to thermal loading exist downstream of the Don Castro Reservoir. San Lorenzo Creek has been highly modified downstream of Foothill Boulevard and does not support fish communities for most of its length. The upper reaches have few deep pools, but good shelter characteristics while the largest and deepest pools are in the lower reaches. There is good riparian vegetation that contributes to instream and overhead cover in the upper reaches (ACFC & WCD 2002). Lower reaches have lower canopy coverage due to widening of the stream channel.

Crow Creek and two of its tributaries, Norris and Bolinas Creeks, have the greatest potential for suitable habitat and water temperatures to support rainbow trout (ACFC & WCD 2002). Crow Creek is characterized by a good mixture of pools, glides, and riffles and has relatively deep pools and moderate shelter complexity.

Habitat Data

Habitat data for the San Lorenzo watershed is available in the Fish Habitat and Fish Population Assessment For The San Lorenzo Creek Watershed, Alameda County, California (ACFC & WCD 2002).

Fisheries and Restoration Projects

Michael Love and Associates (2001) assessed the 2000-foot long culvert on Crow Creek just upstream of its confluence with Cull Creek for fish passage. According to Paul Modrell of ACFC & WCD in Alameda, Alameda County is planning a road-widening project on Crow Canyon Road and the County Environmental Services Division is interested in modifying the culvert to improve fish passage as mitigation.

Alameda County Public Works Agency is preparing a project that will manage sediment accumulations and future sediment inflow at the Don Castro Reservoir. A pilot project was conducted in 2000 and 15,800 cubic yards of sediment was removed from the delta area. The average annual sediment inflow is 8,600 cubic yards.

The ACFC & WCD and DWR's Fish Passage Improvement Program are assessing the future of Cull Creek Reservoir and Don Castro Reservoir on San Lorenzo Creek. Management options being assessed range from periodic desilting to removal of the dams.

The ACFC & WCD have been awarded about $140,000 from the Coastal Impact Assessment Program to assess the feasibility of restoring the entire 5-mile USACE flood control channel. This assessment will be done soon. The ACFC & WCD have also received a $350,000 grant from the EPA's 319-h program to restore a reach of Palomares Creek and construct a field science center.

The ACFC & WCD is collaborating with Caltrans to have a drop structure removed or modified to allow fish passage into the Eden Creek sub-watershed.

York Creek, Napa County

Potential Impediments to Anadromous Fish Migration

There are two dams and one reservoir on the mainstem of York Creek. There is also a second reservoir in the York Creek drainage on an unnamed tributary stream (DFG 1973). York Dam is impassable and is the upstream limit of anadromous fish migration. The lower diversion dam, downstream of York Dam, is passable at high flows (DFG 2000b).

General Description

York Creek is a west side tributary to the Napa River at River Mile 36. It is about 4.5 miles long and drains about 5 square miles. The creek originates in the western hills of the Napa Valley at an elevation of about 1,800 feet. It flows through a narrow canyon, into the Napa Valley, through the town of St. Helena and enters the Napa River at an elevation of 220 feet. Upstream of the Highway 29 crossing the stream drops in elevation an average of 230 feet per mile. Downstream of the Highway 29 crossing the stream is less steep and only loses 30 feet per mile (DFG 1974).

Fish Populations

York Creek was historically a steelhead stream and today supports a run of steelhead below Saint Helena Upper Dam (York Dam) as well as a population of rainbow trout in the 2 miles of habitat above the dam. The most recent survey of York Creek was done in September 2000. The creek was electrofished from the base of the dam to about a mile downstream to a driveway that leads to the city of St. Helena water tanks. Juvenile steelhead were found to be abundant and were distributed uniformly. Most of the fish were young-of-year with fewer fish being yearlings and older. In the mile sampled, about 200 fish were seen (DFG 2000a). A May 1986 DFG survey of the creek above York Dam revealed 10 rainbow trout in the 500-foot long reach surveyed (DFG 1986). DFG stream surveys in1974 and 1975 also report steelhead in York Creek. In 1975 there were estimated to be 20 *Oncorhynchus mykiss* every 100 feet from York Dam upstream to the creek's headwaters (DFG 1975). In 1974, below the dam, young-of-year steelhead trout were estimated to exceed 100 per 100 feet of stream (DFG 1974).

Water Quality

Water quality in York Creek has not been studied extensively. The water temperature is generally cold but flow may not be adequate below York Dam. Available temperature data include DFG fish surveys in April 1986 and September 2000. Water temperature was 55° F above the dam in the 1986 survey and 59° F below the dam in the 2000 survey. There have been several sediment spills in York Creek that resulted in fish kills. Other than these spills there are no documented water quality problems in the creek.

Hydrology

A 1993 DFG stream survey reported flows ranging from 0.1 to 1.4 cfs with an average flow of 0.56 cfs below York Dam on 9 Jul (DFG 1973). In a 1974 DFG stream survey, flow above the dam was estimated at 1.5 cfs. Immediately below the dam, flow was 1.0 cfs and 1,000 feet above Highway 29, the flow was 0.5 cfs. Below Highway 29, flows were intermittent during this 13 Jun survey (DFG 1974). In a 1975 stream survey by DFG the flow at York Dam was determined to be 1.0 cfs on 5 Aug (DFG 1975).

Habitat Quality

The habitat in York Creek can be divided into three reaches, from the confluence with the Napa River upstream to Highway 29, from Highway 29 upstream to York Saint Helena Upper Dam, and from the dam upstream to the headwaters. Below Highway 29 there is little cover and annual grasses are the predominant vegetation. Above the Highway 29 crossing "dense stands of vegetation border the stream" providing adequate cover (DFG 1974). There are also boulders and undercut banks that provide shade and shelter in this reach (DFG 1974). In this area, the riffle to pool ratio is 1:1 and the substrate is 60 percent gravel (DFG 1973). Above the dam there is high quality steelhead habitat. The riffle-to-pool ratio was 3:1 and there was 100 percent cover over 90 percent of the pools in this upper reach in a 1975 DFG survey. About 30-40 percent of the streambed above York Dam was considered good spawning habitat because of the good gravel substrate. Significant logjams were observed in the creek during a 1975 DFG survey. The status of those jams is unknown. The most recent survey of the creek was done on 27 Sep 2000. A large number of steelhead were observed below the dam at this time. Water temperature was 59° F and "the overhanging riparian tree vegetation provided about 75 percent shade cover" (DFG 2000b) over the surveyed portion of the creek. There was also good shelter and, according to the DFG survey by Fishery Biologist Bill Cox, the area below the dam "provided habitat with a very high potential to support steelhead" (Cox 2000). Gravel was limited, but present, below the dam (DFG 2000b).

Habitat Data

There are three published DFG stream surveys of York Creek available in the Region III office. One was done in 1973 from the mouth of the creek up to York Dam. The second one, done in 1974, covered the same reach. The third survey, done in 1975, covered the creek from the dam upstream to its headwaters. These surveys contain flow and temperature data as well as information about what fish were present and descriptions of the habitat at the time of the surveys. There is no flow gage on the creek.

Fishery and Restoration Projects

As a result of a complaint filed by the DFG, the city of St. Helena has agreed to remove York Dam. The city is obtaining the required permit from the U.S. Army Corps of Engineers. The estimated cost of removal is $500,000 (DFG 2000a). DWR's Fish Passage Improvement Program began the initial environmental and engineering tasks for removal of the dam. The dam removal project has been turned over to ACOE by the city of St. Helena for further study and evaluations for future removal efforts.

DWR's Fish Passage Improvement Program is finalizing plans and environmental documentation for improving fish passage at the lower diversion dam downstream of York Dam. The diversion dam is owned by the city of St. Helena, and the project is expected to be completed in 2003.